Gy in 28 fractions. Plans were evaluated based on the ability to meet the dose volume histogram. The homogeneity index (HI), conformity index (CI) of target volume, the dose of organs at risk, radiation delivery time and monitor units were also compared. Paired T-test model analysis was used to analyse the two sets of data.

Results: The results showing that postoperative endometrial carcinoma can be implemented CDR-CAS-IMAT plans on conventional Varian 23EX Linac for smoothly and quickly at busy cancer center. Comparing with the IMRT techonology CDR-CAS-IMAT plans can meet the clinical demand(see Figure1), gives comparable OAR and improved CI of PTV (see. Table 1), can reduction treatment time ((84.6±7.8)s Vs. (422.7±46.7)s), MU((787.5±78.5)MU Vs.(927.4±79.1)MU) and high dose irradiated volume; while increase the low dose irradiated volume of healthy tissues and the volume of the bladder and bowel irradiated 40 Gy and 30Gy, respectively. This point needs to pay attention to implementation in clinical. There were no significant differences in other statistical index.

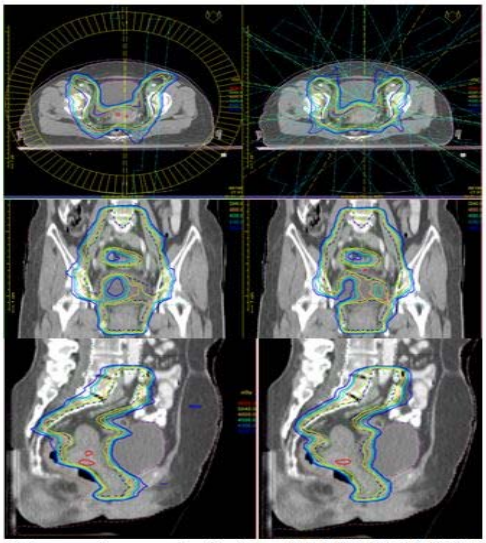

Figure 1. Treatment plan sections dose distribution of CDR-CAS-IMAT (left) Vs. IMRT (right) [Transverse plane(top), Coronal plane(middle) and sagittal plane(bottom)]

Table 1. The dosimetric parameters comparison of CDR-CAS-IMAT and IMRT in target volume and OARs ($\bar{x}\pm s$)

plan	HI (PTV)	CI (PTV)	HI (CTV)	CI (CTV)	D90 (CTV) (cGy)	D95 (CTV) (cGy)	D98 (CTV) (cGy)
CDR-CAS-IMAT	0.12±0.021	0.85±0.03	0.09±0.02	0.46±0.05	5232.5±34.0	5196.2±27.8	5153.2±21.0
IMRT	0.13±0.02	0.81±0.03	0.11±0.02	0.43±0.05	5215.7±31.5	5162.5±31.2	5095.3±34.9
t value	-1.36	3.85	-3.18	4.21	2.13	4.65	7.79
P value	0.193	**0.001**	**0.005**	**0.001**	**0.049**	**0.000**	**0.000**

plan	V95 (CTV) (%)	V98 (CTV) (%)	V100 (CTV) (%)	Cord D2 (cGy)	Rectum V40 (%)	Bladder V50 (%)	Bowel V30 (%)
CDR-CAS-IMAT	99.99±.01	99.8±.14	5232.5±34.0	3743.±118.5	41.8±5.9	17.5±4.4	39.5±6.4
IMRT	99.98±.02	98.9±.6	5215.7±31.5	3806.1±98.5	44.1±4.7	16.7±4.1	36.5±7.3
t value	2.29	6.00	2.13	-2.65	-2.47	2.14	3.00
P value	0.035	**0.000**	**0.049**	**0.017**	**0.025**	**0.048**	**0.008**

Note: D90 is the minimum dose of 90% volume accepted, D95 and so on; V90 is the volume which the target volume irradiated 90% prescription dose, V95 and so on. D_2 is the minimum dose of 2% volume accepted;

Conclusion: Endometrial carcinoma patients with CDR-CAS-IMAT on Varian Clinical 23IX can get equivalent or superior dose distribution compared with the IMRT technology. CDR-CAS-IMAT have much less treatment time and MU can reduce the uncertainty factor and patient discomfort in treatment.

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Impact of flatting filter free photon beam on Rapid-arc radiotherapy for gynecological malignancies

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Purpose or Objective: Aim of this study was to determine the dosimetric impact of flatting filter free beam (FFFB) of 6 and 10 MV energies on rapid-arc (RA) radiotherapy planning for gynecological malignancies.

Material and Methods: RA plans were generated using double arc for a cohort of ten patients using 6 and 10 MV FFFB. Plans were generated to deliver a dose of 50.4 Gy in 28 fractions for Planning target volume (PTV) and ALARA were used as an objective for Organs at risk (OARs). Plans were analysed for PTV Coverage, conformity Index (CI), homogeneity index (HI), dose to OAR's, integral dose to normal tissue (NTID) and total no. of monitor units (MUs).

Results: The volume of PTV receiving prescription dose were 95.03+ 0.09% and 95.09+ 0.10%, HI were 1.062+ 0.008 and 1.066+ 0.008,CI were 1.007+ 0.016 and 1.012+ 0.013, mean NTID were 272.2+ 37.1 and 261.1+ 33.2 (liter-Gy), MUs number were 629.6+ 31 and 647.2+ 44 for FFFB using 6 and 10 MV respectively. There were no statistically significant (p>0.05) difference found in mean doses to bladder, rectum, bowel and both femoral heads for FFFB using 6 and 10 MV respectively. There were significant (p <0.05) difference found in HI, MU number and NTID for FFFB using 6 and 10 MV respectively.

Conclusion: FFFB of 6MV was found superior in comparison to 10MV for RA planning in case of gynecological malignancies. It offers better HI, CI, less number of MUs (2.8%) and delivers more NTID (4.3%) for similar target coverage and OAR's sparing.

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Stereotactic body radiotherapy for early-stage lung cancer with flattening filter free beams

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Purpose or Objective: The purpose of this study is to investigate the treatment plan dosimetry and delivery efficiency between the single-arc and double-arc techniques using stereotactic body radiotherapy with flattening filter free beams for early-stage lung cancer.

Material and Methods: Nineteen patients were included in this investigation, and each patient was arranged single-partial-arc (SA) and double-partial-arc (DA) techniques using the Eclipse 10.0 treatment planning system. The prescription dose was 48Gy/4 fractions and the photon beam energy was 6 MV flattening filter-free (FFF) beams from Truebeam linear accelerator. The treatment plans were appraised by Radiation Therapy Oncology Group (RTOG-0915) criteria for planning target volume (PTV) coverage and organs at risk (OAR) sparing. All plans were normalized to 100% of prescribed dose at least covering 95% of the PTV. Treatment efficiency was evaluated via monitor units (MUs) and treatment times were compared.

Results: The PTV volumes range from 20.46 to 88.37 cm3. Compared to the SA and DA plans, there was no significant difference in PTV coverage, except the maximum dose in the PTV. The maximum dose of SA technique was slightly higher than that of DA technique. The mean PTV conformity index (CI) for SA and DA was 1.06±0.05 and 1.01±0.03 respectively.